



Data Sheet / Issue 10/03 / Replaces Issue 11/02

AIREX® R63 DAMAGE TOLERANT FOAM

SEPTEMBER 03

Description

A closed-cell, linear, thermoplastic foam with extremely high damage tolerance. This one of a kind formula combines very high elongation and excellent bond strength. It is cold formable to simple shapes and thermoformable to complex 3-dimensional curves, and is non-friable. It is an exceptional core material for dynamically loaded and shock absorbing sandwich structures.

Applications

- **Marine**
hull bottoms, hull sides
- **Road and Rail**
front-ends, side skirts, crash belts
- **Aircraft**
explosion proof cargo containers
- **Recreation**
surfboards, canoes, kayaks
- **Industrial**
containers, shelters, helmets

Characteristics

- extraordinary impact strength (non-brittle failure mode)
- easy to thermoform
- dimensionally stable
- excellent fatigue resistance
- outstanding adhesion
- non biodegradable
- good sound and thermal insulation

Processing

- contact molding (hand/spray)
- adhesive bonding
- thermoforming
- pre-preg processing
- vacuum infusion

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FACSIMILE TRANSMITTAL MEMO

ALCAN COMPOSITES



revised: 27.05.2003



Material Safety data sheet for AIREX[®] R63

According to 2001/58/EG

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| 1. | Identification of substance / preparation and of the company AIREX [®] R63 Rigid foam (R63.50, R63.80, R63.140) <i>Use of substance / preparation</i> : Core material in sandwich constructions <i>Company identification</i> : Alcan Airex AG CH-5643 Sins (Switzerland) Phone +41 41 789 66 00 Fax +41 41 789 66 60 |
| 2. | Composition / Information on Ingredients Rigid polymeric foam on the basis of Polyvinylchloride (PVC), co-polymerised with methylmethacrylate, foamed using non ozone depleting blowing agents. The material (polymer) is linear and thermoplastic. <i>Further ingredients</i> : Residual solvents (< 5 %) (aromatic hydrocarbon). Cobalt soap as promoter compound (approx. 1000 mg/kg [ppm]) Lead stabiliser (approx. 8000 mg/kg [ppm]) Decomposition products of chemical blowing agent |
| 3. | Hazards identification AIREX [®] R63 does not constitute any risk to public health and environment if it is used as intended. Fine dust is produced while sawing, milling, grinding and sanding. Irritant fumes may be produced while thermoforming. |
| 4. | First aid measures <i>Inhalation of processing fumes</i> : Move victim to fresh air; obtain medical attention if irritation persists. <i>Inhalation of gases in case of fire</i> : Move victim to fresh air and obtain medical attention. <i>Skin contact</i> : Wash with water. <i>Eye contact</i> : Flush with water if irritation develops. <i>Ingestion</i> : No special measures required. Seek medical attention if symptoms develop. |
| 5. | Fire-fighting measures <i>Suitable extinguishing media</i> : foam, water spray, extinguishing powder, carbon dioxide. <i>Extinguishing media which must not be used</i> : direct water jet. <i>Hazardous combustion products</i> : hydrogen chloride (HCl). Use respiratory protection independent of recirculated air. |
| 6. | Accidental release measures No special measures required. |
| 7. | Handling and storage <i>Handling</i> : No special measures required. <i>Storage</i> : Stow away from immediate and dangerous sources of ignition. Danger of electrostatic charges when stored in very dry areas. |
| 8. | Exposure control / personal protection <i>Exposure limit values</i> : not applicable. <i>Exposure controls</i> : The use of gloves, protective goggles and dust masks and also the use of dust extraction equipment is recommended for sawing, milling, grinding and sanding. For thermoforming, the workplace should be continuously supplied with fresh air. Where necessary, a respiratory protection is recommended. |

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| 9. | Physical and chemical properties | | |
| | Physical state / form: | Polymer foam sheet with visible cell structure. | |
| | Colour: | yellow. | |
| | Glass transition temperature: | 55 to 60 °C | ISO 537 |
| | Decomposition temperature | > 180 °C | |
| | Flash ignition temperature | 310 °C | ASTM D 1929 |
| | Density | 50 - 160 kg/m ³ | ISO 845 |
| | Solubility | Insoluble in | Water, sea water, acids, alkalis, aliphatic hydrocarbons |
| | | Soluble in | Organic solvents such as aromatic hydrocarbons, ketones, chlorinated hydrocarbons |
| 10. | Stability and reactivity | | |
| | <i>General information:</i> Stable under normal conditions | | |
| | <i>Conditions to avoid:</i> high temperatures (> 180 °C) | | |
| | <i>Materials to avoid:</i> not applicable. | | |
| | <i>Dangerous decomposition products:</i> | Hydrogen chloride (HCl) Carbon monoxide (CO) Carbon dioxide (CO ₂) | |
| 11. | Toxicological information | | |
| | <i>Toxicological tests:</i> No data available. | | |
| | <i>Experience with man:</i> | | |
| | <i>Skin contact:</i> Grinding dust may cause irritation to people with sensitive skin. | | |
| | <i>Eye contact:</i> Dust may cause irritation. | | |
| | <i>Inhalation:</i> Dust may cause irritation of respiration tract. | | |
| | <i>Ingestion:</i> No symptoms known. | | |
| 12. | Ecological information | | |
| | <i>Ecotoxicity:</i> Contains cobalt promoter and lead stabiliser. | | |
| | <i>Mobility:</i> Not soluble in water, therefore effects on groundwater are unlikely. | | |
| | <i>Persistence and degradability:</i> Biologically not degradable. | | |
| 13. | Disposal considerations | | |
| | Subject to legislation by local authorities, the product can be disposed of together with domestic refuse and industrial waste. Waste and residues can be incinerated in a plant equipped with flue gas washing, together with domestic waste. | | |
| 14. | Transport information | | |
| | Railroad | RID | no restriction |
| | Road ADR | | no restriction |
| | Sea IMDG Code | | no restriction |
| | Air | ICAO-TI/IATA-DGR | no restriction |
| | UN-Classification | | not required |
| 15. | Regulatory information | | |
| | AIREX® R63 rigid plastic foam does not require marking under the dangerous substances and preparation directives 67/548/EEG and 1999/45/EG. | | |
| 16. | Other information | | |
| | This issue of the safety data sheet replaces the issue released on 18.2.2000. | | |
| | The information given in this material safety data sheet is accurate to the best of our knowledge, but without any guarantee. It is given in good faith based on the current state of knowledge and experience. It is issued in respect of safety requirements and does not purpose to provide information on the quality of the material. | | |

| Typical properties for AIREX® R63 | | | R63.50 | R63.80 | R63.140 |
|--|-------------|---------------------------|----------------------------|---------------------------|---------------------------|
| Apparent nominal density | ISO 845 | kg/m³ lb/ft³ | 60 3.7 | 90 5.6 | 140 8.7 |
| Compressive strength perpendicular to the plane | ISO 844 | N/mm² psi | 0.38 55 | 0.90 130 | 1.6 230 |
| Compressive modulus perpendicular to the plane | DIN 53421 | N/mm² psi | 30 4350 | 56 8120 | 110 16000 |
| Tensile strength in the plane | DIN 53455 | N/mm² psi | 0.90 130 | 1.4 200 | 2.4 350 |
| Tensile modulus in the plane | DIN 53457 | N/mm² psi | 30 4350 | 50 7250 | 90 13100 |
| Shear strength | ISO 1922 | N/mm² psi | 0.50 72 | 1.0 145 | 1.85 270 |
| Shear modulus | ASTM C393 | N/mm² psi | 1.1 1600 | 2.1 3050 | 3.7 5370 |
| Shear elongation at break | ISO 1922 | % | 70 | 75 | 80 |
| Impact strength | DIN 53453 | kJ/m² ft.lb/in² | 4.0 1.9 | 5.0 2.4 | 6.5 3.12 |
| Thermal conductivity at room temperature | ISO 8301 | W/m.K BTU.in/ft².hr.°F | 0.034 0.24 | 0.037 0.26 | 0.039 0.27 |
| Plain sheet | width | mm ± 10 in | 1300 to 1400 51 to 55 | 1200 47.25 | 1050 41.3 |
| | length | mm ± 10 in | 2900 to 3100 114 to 122 | 2700 106.3 | 2400 94.5 |
| | thickness** | mm ± 0.5 in | 5 to 50 0.197 to 1.97 | 3* to 30 0.118 to 1.18 | 3* to 20 0.118 to 0.78 |
| Contoured | width | mm ± 5 in | on request | 520 20.5 | on request |
| | length | mm ± 5 in | | 1200 47.25 | |
| | thickness | mm ± 0.5 in | | 10 to 25 0.38 to 1 | |
| Color | | | brownish yellow | brownish yellow | brownish yellow |

Other dimensions, configurations, and closer tolerances upon request

* Tolerance for 3 mm: +0.8mm / - 0.2mm

**thicker sheets can be laminated

The data provided gives approximate values for the nominal density. Due to density variations these values can be lower than indicated above. Minimum values to calculate sandwich constructions can be provided upon request.

The information contained herein is believed to be correct and to correspond to the latest state of scientific and technical knowledge. However, no warranty is made, either expressed or implied, regarding its accuracy or the results to be obtained from the use of such information. No statement is intended or should be construed as a recommendation to infringe any existing patent.

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